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OAK RIDGE NATIONAL LABORATORY

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ORNL/TM-13222

Technical Support Section Annual Work Plan for FY 1996

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INSTRUMENTATION & CONTROLS DIVISION

MANAGED AND OPERATED BY
LOCKHEED MARTIN ENERGY RESEARCH CORPORATION
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Intrumentation and Controls Division

TECHNICAL SUPPORT SECTION ANNUAL WORK PLAN FOR FY 1996

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1. INTRODUCTION/OVERVIEW

The Technical Support Section (TSS) of the Instrumentation and Controls (I&C) Division of Oak Ridge National Laboratory (ORNL) provides technical services such as fabrication, modification, installation, calibration, operation, repair, and preventive maintenance of instruments and other related equipment. Work performed by TSS is in support of basic and applied research and development (R&D), engineering, and instrument and computer systems managed by ORNL.

It is the mission of TSS to support programs and policies of ORNL, emphasizing safety and ensuring cost-effective support for R&D.

Because the activities and priorities of TSS must be adapted to the technical support needs of ORNL, the TSS Annual Work Plan is derived from and driven directly by current trends in the budgets and activities of each ORNL division for which TSS provides support. Trends that will affect TSS planning during this period are reductions in the staffing levels of some R&D programs because of attrition or budget cuts and the establishment of new facilities or environmental safety and health programs.

TSS does not have an annual budget to cover operating expenses incurred in providing instrumentation maintenance support to ORNL. Each year, TSS contacts ORNL division finance managers or division finance officers to obtain information concerning projected funding levels of programs and facilities they manage. TSS workforce and resource projections are based on the information obtained and are weighted depending on the percentage of support provided to that division or program. Annually, TSS sets the standard rate per hour to charge for the following fiscal year. The standard rate is based on annual-projected inflation rate, proposed increases or decreases in manpower due to perceived changes in program or division funding, upgrade or aging equipment or facilities, overhead burden, compliance with new requirements or directives, labor contract negotiations, and the fringe benefit rate. The standard rate is charged to customer accounts or work orders as the work is performed. A cost variance occurs when there is a difference between the actual cost per hour and the standard rate per hour. Typically, this variance is positive during months of high fringe benefit cost (holidays and vacation) or when materials or equipment is costed by Accounts Payable. Variances are negative during months with minimal fringe benefit cost and when purchased materials that are necessary for maintenance support are charged back to customer accounts.

The Long-Range Work Plan (see Sect. 6) is based on estimates of impact of the long-range priorities and directions of the Laboratory. Identifiable proposed new facilities and programs provide additional basis for long-range planning. After identifying long-range initiatives, TSS planning includes future training requirements, reevaluation of qualifications for new-hires, and identification of essential test equipment needed in new work.

Although TSS has no direct responsibility for the maintenance or repair of real property, it does perform breakdown maintenance, preventive maintenance, and calibration of Laboratory, production, and experimental equipment, all of which is used for programmatic purposes. Operating expense funds from supported divisions support this type of equipment.*

*The cost of full-time equivalents (FTEs) for this effort is included in the Cross-Cut Budget under the category of "Operating Expense Support of Programmatic Equipment."

2. ANALYSIS OF PREVIOUS YEAR'S PERFORMANCE (FY 1995)

2.1 HFIR OPERATIONS

Although TSS discontinued full time support to the High Flux Isotope Reactor (HFIR) on October 1, 1994, our database system continues to support their calibration and work control system. We print their recall calibration and preventive maintenance job tickets, track the maintenance history of HFIR instruments, and track training in our Maintenance Information and Data Acquisition system/Maintenance, Accountability, Jobs, and Inventory Control (MIDAS/MAJIC) database. The maintenance support group inputs the data directly into our system. We also, on special request, supply technical support and training when needed.

2. 2 MAINTENANCE ENGINEERING SUPPORT

The TSS maintenance engineering staff provided engineering support for a variety of small projects in many research divisions. Some of these projects include:

- Thermal Hydraulic Test Loop for the Advanced Neutron Source Reactor project.
- Control and data acquisition instrumentation for the Heavy Steel Section Irradiation Experiment at the Phoenix-Ford Reactor at the University of Michigan.
- Self-cleaning Ultrasonic Sludge Blanket Monitor for the waste processing plant.

2.3 TRAINING

The training program for TSS personnel continued to evolve during FY 1995. Training needs were updated to reflect the changing scientific and technological environment at ORNL. In FY 1995, 115 training classes were attended by TSS personnel.

TSS continues the policy of recognizing specialized instrument technician categories. This policy is reflected in the FY 1996 Technical Support Section Training Program (MMD/AADM1240). Instrument technicians are assigned to one of the following specialized categories.

Nuclear Facilities	Nonuclear Facilities
Facility Support	Networking and Systems Support
Electronic Instrumentation	Communications and Security
Process and Industrial Instrumentation	Engineering Support
Special Electronics and Environmental Monitoring	Personal Computers

TSS technical training offers a curriculum to support the activities of each category as a guideline to first-line supervisors.

A Baseline Evaluation Testing and Training (BETT) program is available to assess knowledge on various disciplines encountered by TSS instrument technicians. Scores on each listed technology are compared to a standardized matrix, which indicates whether a particular employee has sufficient knowledge to perform tasks required of a specific speciality. This process quickly ascertains deficiencies in the individual's speciality so that training can be identified and provided to address only that knowledge the employee needs. This process avoids teaching unnecessary skills, assuring a cost-effective and continuously renewable qualification process.

An additional benefit is that this system contains elements necessary for determination and documentation of specific technical qualification of technicians, greatly assisting with compliance with Department of Energy (DOE) orders such as 5480.20A and 4330.4B. The TSS training program is controlled by TSS administrative procedures and defines how instrument technicians qualify to perform work in nuclear facilities at ORNL. This qualification/training program will ensure technical efficiency for TSS instrument technicians into the twenty-first century. The TSS training program is subordinate to The Instrumentation and Controls Division Training Plan for FY 1996.

2.4 INITIATIVES

Successful pilot work teams were established in TSS to better serve the needs of the Laboratory. The primary mission of these unique teams is to calibrate and to maintain safety-related instruments identified in nonreactor nuclear facilities with Operating Safety Requirements (OSRs) or Limiting Condition Documents (LCDs).

The Personal Computer Accelerated Vendor Inventory Delivery (AVID) contract was rebid and again awarded to Theta Systems. The TSS Personal Computer Maintenance Group provides in-house maintenance and warranty repairs for equipment on the Personal Computer AVID contract. The maintenance group and AVID vendor have provided cost-efficient, timely warranty and repair of equipment. The new Pentium Personal Computers have been added to the contract to replace old technology equipment.

A joint effort between Plant & Equipment Division and I&C TSS has been implemented to identify opportunities to apply predictive maintenance (PdM) techniques at ORNL. A team has been formed to promote the practice of PdM and to solicit funds for PdM R&D at ORNL. The team has identified crucial systems where this principle can be applied, and team members investigate each situation to evaluate how PdM can reduce life cycle costs for systems.

2.5 TSS REORGANIZATION

TSS lost 18 staff members to the company's early retirement incentive plan in December 1994. Because of these reductions and other management mandates, TSS initiated an aggressive reorganization plan. The goals of the reorganization were to streamline operations, increase customer service, reduce costs, and better balance the workload across field shops. The section was reorganized from ten major shops to eight. Similar functions that were previously maintained across several shops were combined into one. Four of our field shops were relocated into a new maintenance building. Three other shops were also relocated to the customer site to better accommodate their needs.

As a result of the retirement incentive and reorganization, nine instrument technicians were hired and four instrument technicians were promoted to engineering technologist positions to help ease the burden of the shop supervisor. Plans are to increase the number of technicians during FY1996.

3. ANNUAL WORK PLAN

Each major research division was contacted to determine the projected programmatic level of funding for the next fiscal year. Most divisions projected that their funding levels would remain near those of FY 1995. Overall, FY 1996 operating-expense-funded maintenance and repair requirements for ORNL are projected to be relatively level with those of FY 1995. Analysis of DOE orders and technical training needs to evaluate training program costs, work force requirements, and types of qualifications for new-hires was performed. Routine and breakdown maintenance is expected to remain relatively stable, enabling work to be performed by current staffing levels.

4. FINANCIAL ANNUAL WORK PLAN

MAINTENANCE	FY95	FTE	FY96	FTE	FY97	FTE	FY98	FTE
Administration	651	9	639	9	658	9	678	9
Communications/ Security	724	10	710	10	732	10	754	10
Electronic Instrumentation	941	13	994	14	1,024	14	1,055	14
Engineering Support	1,158	16	1,208	17	1,244	17	1,281	17
Facility Support	1,302	18	1,350	19	1,390	19	1,432	19
Networking & System Support	1,158	16	1,136	16	1,171	16	1,206	16
Process & Industrial Instrumentation	1,013	14	994	14	1,024	14	1,055	14
Personal Computers	1,519	21	1,563	22	1,610	22	1,658	22
Special Electronics & Environmental Monitoring	941	13	923	13	951	13	980	13
TOTAL ($ x 100)	9,406	130	9,518	134	9,804	134	10,098	134

5. MAINTENANCE BACKLOG

$$\text{Backlog Hours} = \frac{\textit{Estimated Corrective Maintenance Backlog Hours}}{\textit{Labor Productivity (\%)}} \quad \frac{363}{.95} = 382.10 \text{ hours}$$

Corrective Maintenance Backlog Labor Cost	=	Backlog Hours	x	Charge Out Rate	
		382.10	x	$48.22	= $18,424.86

Total Corrective Maintenance Backlog Cost	Corrective Maintenance Backlog Labor Cost	+	Estimated Material Cost	
	$18,424.86	+	$1,498.32	= $19,923.18

6. LONG-RANGE WORK PLAN

Long-range work projections of TSS are based on projections and funding levels of ORNL research divisions. Several significant research projects and programs are projected to begin within the FY 1996 to FY 1998 period.

7. MAINTENANCE PERFORMANCE INDICES

Labor Productivity (Effectiveness) $\dfrac{\textit{Standard Hours Earned}}{\textit{Actual Hours Expended + Delays}} \quad \dfrac{8389.9}{8786.5} = .95$

Cost Per Standard Hour $= \dfrac{\textit{Chargeout Rate}}{\textit{Effectiveness}} \quad \dfrac{48.22}{.95} = \$50.76$

Total Corrective Maintenance Backlog Cost $= \dfrac{\textit{CM Backlog Hours}}{\textit{Labor Productivity}} \quad \dfrac{363}{.95} \times \$48.22 + \$1498 = \$19,923.18$

PM Completion Rate $\dfrac{\textit{PMs Completed}}{\textit{PMs Scheduled}} \quad \dfrac{18,004}{18,774} = 96\%$

Schedule Compliance $\dfrac{\textit{PMs + CMs Completed on Schedule}}{\textit{PMs + CMs Completed}} \quad \dfrac{19,132}{27,643} = 69\%$

Corrective Maintenance Backlog $= \dfrac{\textit{CMs Open > 3 Months}}{\textit{CMs Open}} \quad \dfrac{30}{215} = 14\%$

Preventive Maintenance Overdue $= \dfrac{1082}{18774} = 6\%$

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